DRAFT RECOVERY OBJECTIVES
for the
Arkansas River shiner

2008

I. Introduction

This document lays out a preliminary course of action for recovery of the Arkansas River shiner. It will serve to guide recovery efforts and inform consultation and permitting activities until a comprehensive recovery plan for the species has been finalized and approved.

Listing and contact information follow:

Scientific name:	*Notropis girardi*
Common name:	Arkansas River shiner
Listing classification:	Threatened
Listing Date:	November 23, 1998 (species) – Fed Reg 63 64772-64799
	October 13, 2005 (critical habitat) – Fed Reg 70 59808-58864

II. Listing Factors and Current Threats

(1) The present or threatened destruction, modification or curtailment of habitat or range.

Impacts to Arkansas River shiner habitat and range result from the following causes: (1) reservoir construction; (2) stream channelization; (3) streamflow alteration; (4) streamflow depletion; (5) water quality degradation; (6) invasive plant species; and (7) competition with invasive fish species.

(2) Overutilization for commercial, recreational, scientific, or education purposes.

We have no evidence that the ARS is being overutilized for commercial, recreational, scientific, or educational purposes.

(3) Disease and Predation

No studies have been conducted on the impact of disease or predation upon the Arkansas River shiner; therefore, the significance of these threats upon existing populations is unknown. There is no direct evidence to suggest that disease threatens the continued existence of the species.

(4) Inadequacy of Existing Regulatory Mechanisms

Threats continue from streamflow depletion, water quality degredation, and streamflow

alteration. Existing regulatory mechanisms either lack the capacity or have not been implemented adequately to decrease or remove these threats.

(5) Other natural and manmade factors affecting the species continued existence

The overall trend in the status of this species is characterized by dramatic declines in numbers and distribution despite the fact that this species evolved in rapidly fluctuating, harsh environments. The occurrence of a single, catastrophic event, such as the introduction of competing species, a contaminant spill, or a prolonged period of low or no flow, would increase the likelihood of extinction. Arkansas River shiners are undoubtedly capable of recovering from drought, provided other factors have not irreparably degraded their habitat. The fragmentation and apparent isolation of self-sustaining populations of ARS renders the remaining populations vulnerable to any natural or manmade factors that might further reduce population size.

III. Proposed Recovery Actions

1.1 Additional research on the Arkansas River shiner's life history, ecology, and behavior.

Perpetuation of the Arkansas River shiner in the wild depends upon a thorough knowledge of the species' life history, ecology, and behavior, and application of that knowledge to restore and protect appropriate habitats. Information essential for proper management of the species includes, but is not limited to, spawning patterns such and movement, timing and duration, early life history, and feeding habits.

1.2 Investigate and determine habitat requirements.

This action will help to fill in gaps in our knowledge of the habitat needs of the Arkansas River shiner, as well as help to determine areas where the species may be reintroduced in the future. Information on seasonal shifts and ontogenic variation will be essential. This will include an assessment of essential flow regimes of the species necessary for reproduction and survival.

1.3 Conduct genetic studies on Arkansas River shiner populations.

The ability of a species to persist over the long term is determined in part by the amount of genetic variation that is retained by a species. Assessing Arkansas River shiner genetic diversity is necessary to evaluate the effectiveness of measures taken to maintain genetic diversity.

1.4 Determine the nature, extent, and role of water quality degradation in the decline of the Arkansas River shiner, as well as the water quality standards necessary for its protection and recovery.

Many land use activities and their resultant discharges (both point and non-point) have the potential to affect the Arkansas River shiner and its habitat. These include discharges from industrial sites, wastewater treatment plants, flood channels, and mining sites, runoff from feedlots and grazing land, return flows from agriculture, and other sources. The impacts of these activities and their discharges are not well understood and should be investigated.
Water quality is not only affected discharges, but also a decrease in water quantity which results in less dilution of the above mentioned discharges. Additionally, the concentration of natural elements such as chlorides, will also increase as a result of water depletions and could reach levels intolerable to Arkansas River shiners.

1.5 Determine the nature and extent of interaction between other fish species (native and non-native) and Arkansas River shiner, and the role of these species in the decline of Arkansas River shiner.

The introduction and spread of non-native fish species has been identified as a threat to the continued existence of Arkansas River shiner. Accidental bait bucket introduction of Red River shiners, *Notropis bairdi,* may have contributed to the decline of Arkansas River shiners in the Cimarron River, however the exact competitive interaction is unknown.

1.6 Ensure the survival of the Arkansas River shiner in its current habitat.

Continue to ensure that any activities that may affect Arkansas River shiners are in compliance with the Endangered Species Act (ESA). This would include consultation with Federal agencies in accordance with section 7 of the ESA, the development of Safe Harbor Agreements and Habitat Conservation Plans, in addition to other management plans that would aid in conserving the species.

1.7 Continue Arkansas River shiner captive propagation activities.

Propagation activities on the Arkansas River shiner has been effective in the past, however no current work is underway. These efforts should continue in order to provide Arkansas River shiners for reestablishment of additional populations and possible augmentation during extreme drought.

1.8 Develop a salvage plan for the Arkansas River shiner.

A salvage plan should be developed to ensure that existing populations will persist during extreme drought situations. With the species decline of over 80 percent of it's historic range, such a plan becomes more important. The plan would include salvage of trapped individuals during pooling of the river, hatchery related activities to maintain those capture fishes until drought ends, and possible propagation and augmentation of populations, if necessary.

1.9 Continue Arkansas River shiner monitoring program.

Sampling methodology and statistical analysis will continue to be improved with the goal of establishing a long-term monitoring plan.

1.10 Restore, protect, and modify habitats as necessary to alleviate threats to the Arkansas River shiner.

As described earlier in listing factors, various activities have reduced and altered Arkansas River shiner habitat within the historic range of the species. To ensure survival of the species, it will be necessary to restore and protect habitats (including riparian areas), as well as develop and implement water management strategies that maintain suitable habitat.

1.11 Re-establish Arkansas River shiner at appropriate locations in its historical range.

2.1 Periodically review, evaluate, and revise research and management activities to ensure progress toward recovery of the Arkansas River shiner.

As projects are completed or relevant findings verified, new information may identify additional or alternative research needs or recovery actions that may be needed. Adaptive management will allow for the development of new research and implementation of management activities. As necessary, recovery actions and goals may be refined or revised to reflect new information and understanding.

2.2 Develop and implement an outreach and communications plan that will help all interested parties better understand the Arkansas River shiner and its habitat, as well as related conservation and water management issues and how they affect the human community.

Abbreviations for the Proposed Implementation Schedule

ALL	All interested parties
BLM	U.S. Bureau of Land Management
COE	U.S. Corps of Engineers
EPA	U.S. Environmental Protection Agency
FWS	U.S. Fish and Wildlife Service
LOCAL	Local entities, including private landowners and local government
NGO	Nongovernmental organizations
NPS	National Park Service
NRCS	Natural Resources Conservation Service, U.S. Dept. of Agriculture
OCES	Oklahoma Cooperative Extension Service
ODEQ	Oklahoma Department of Environmental Quality
ODWC	Oklahoma Department of Wildlife Conservation
OWRB	Oklahoma Water Resources Board
TNC	The Nature Conservancy
UNIV	Academic institutions
USGS	U.S. Geological Survey